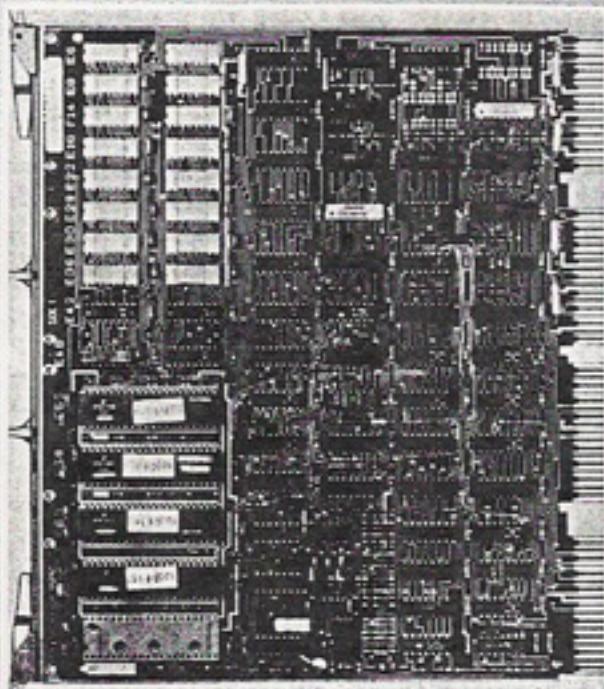


# HISTORICALLY BREWED

Issue #1 Aug/Sept 1993

HCS  
2.50

A Publication of the  
Historical Computer Society



*The  
Beginning  
of the  
Beginnings*

## THE GUI: WHERE DID ITS HISTORY REALLY BEGIN?

STAR TREK AND  
ITS INFLUENCE  
ON PERSONAL  
COMPUTERS

## A LOOK AT PARC

PLUS:  
THE ALTAIR  
CROMEMCO  
NEW BOOK REVIEW  
LETTER PAGE  
THE ZALTAIR?

IT'S A FACT FILLED  
HISTORICAL  
SMORGASBORD!

# Welcome to the first issue of *Historically Brewed!* The Historical Computer Society's Bimonthly newsletter. The

Society and this newsletter have been started in the pioneering spirit of the early computer clubs. One of the most famous groups was the *Homebrew Computer Club* from the San Francisco Bay area started in March of 1975. No other single organization helped to spawn more of today's computer legends than *Homebrew*. This is why I chose the name Historically Brewed for our newsletter. Even with today's impressive technological breakthroughs in computing, the pioneering spirit doesn't seem to be a part of it anymore. HCS hopes to rekindle some of that excitement.

HCS' mission is simple. We are a non-profit organization dedicated to preserving older and classic computer hardware, software and literature while educating and helping our members as well as the public. Historically Brewed is all about personal computer history and computer history in general! In only 18 short years, there is much history to be shared.

I am the founder and President of HCS as well as the Editor of *Historically Brewed*. I believe in what I am doing and I enjoy it as well. I hope that you too can share in my passion and become involved with HCS. I have plenty of good stories planned for future issues, but I cannot continue to write the newsletter alone forever. Please feel free to submit any computer stories that interest you. It can be about a personal experience or not. We at HCS welcome any comments or suggestions which will help with the success of this group and/or newsletter.

I would like to also tell you a little about myself and how all of this began. I am

29 years old, married, and have a new little girl who was just born on July 20th! (Adeline Nicole or Addy or "Ada-baby" like my wife Tamara calls her.) I was born and raised in Jacksonville, Florida. I have been a Macintosh enthusiast for a while now, but my first computer was a Commodore 64 which I received as a Christmas present in 1985. I only owned the cpu, so all I did with it was to fool around with basic. My interest in computers didn't really peek until I first laid fingers on a Macintosh back in January of 1987 while I was working at a computer store in Frederick, Maryland. I was still fairly new to computers and the Mac attracted me right away. There was something comforting about this cute little computer that was so easy to use. A funny thing about the store I worked in - all of us salespeople mostly sold DOS computers, but we did all of our work on the trusty Macs. I wanted a Macintosh really bad, but I couldn't afford one . . . even with my employee discount (the basic model was around \$1400 and an extra drive was about \$400, Yipe!) I only worked at the store for a few months because I decided to move back to Jacksonville, but my passion for computers and especially the Macintosh had been seeded.

In Jacksonville, I got a job at an Apple dealer working part-time. I was at work one day when an Apple rep brought by one of the original Mac II prototypes to demo. It seemed incredibly fast and I was very impressed. Now color was available on the Mac and I didn't even own a regular one yet. Two years later, I again sold Macs but for a dealer in Gainesville, Florida during 1989 and 1990 while I went to

*Historically Brewed*  
is a bimonthly  
publication of the

# Historical Computer Society

*"Admirers of the youngest  
antiques around!"*

To subscribe and join, please  
send a check or money  
order for \$15.00 to:

HCS  
10928 Ted Williams PL  
El Paso, TX 79934

Donations of "classic" computers, software  
or literature are tax deductible.

## OLSON COMPUTERS

• Commodore PET

Ohio Scientific  
**Challenger III**

**Challenger IIP**

VideoBrain



Olson - 8 8080

Write for FREE Computer Catalog

college. It was during this time that I finally bought my first Macintosh!

Again, even with an employee discount, I couldn't afford a basic Mac - the Macintosh Plus with a 20 MB external HD: \$1600! But, one day a guy brought in his Mac XL (just like an Apple Lisa computer) for service and I was fascinated by it. I had seen ads by a company called Sun Remarketing in Utah, who were selling original Lisa computers at discounts (the prototype for the Macintosh which Apple sold in 1983 for around \$10,000!) So I bought one from them for \$1095. For all practical purposes it was just like a Mac Plus, except that it had a 12" diagonal screen that I liked better. When it "booted-up" it loaded a program called "MacWorks Plus" that allowed it to emulate a newer Mac operating system. I had no problems using many different Macintosh programs on Lisa. Many games wouldn't work on her though because she didn't have a sound chip. If you tried to play a game that directly addressed the sound chip, the system would crash. That wasn't a big problem because I mostly used the Lisa for desktop publishing.

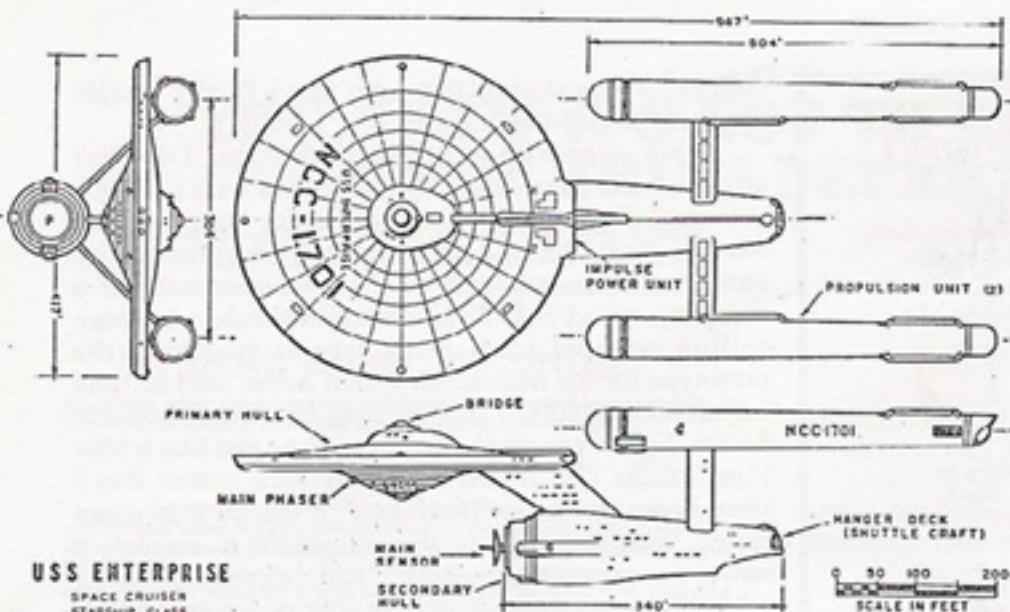
During the Summer of 1990 I worked for a company back in Jacksonville that was developing a new integrated program for the Mac. I was a beta tester for them and I got the chance to see some impressive Pascal programming done. The software I worked on became what is now known as Symantec's GreatWorks. I also did some beta testing on a prototype Classic and LC.

In November of 1990, I decided that I needed a change of pace. My beta testing job hadn't turned into everything that I had hoped it to be. What I needed was a stable career oriented job, so I joined the Army! I am now a Radio Repairer here at Fort Bliss in El Paso, Texas. My wife (who I met in the Army) and I just returned from 20 months in Germany. It was overseas that I became more and more intrigued with computer history. I made reading about and collecting old computers my hobby and decided that when we returned to the States, I would try and start a historical computer club. I hope you will help me make it a winner.

Our main story this issue was inspired by my interest in the Lisa and Macintosh's history. The history of *graphical user interfaces* starts much earlier than most people realize. I hope you are enlightened.

*David A. Greelish*

David A. Greelish  
CompuScrvc #100116.217



# COMPUTER TREK

by David Greelish

**S**omehow, there has always been a connection between STAR TREK and personal computing. It is one of those things that is difficult to explain, but nevertheless true. STAR TREK's popularity is more apparent today in computing than ever before with a variety of STAR TREK software like games, screen savers, fonts and sounds. There are even STAR TREK mouse pads available. It seems as if a version of a STAR TREK game has been around for as long as computers themselves. Could STAR TREK have influenced the development of the personal computer?

STAR TREK was not a huge success when it originally aired on NBC between 1967 - 1969. Yes, it did have a dedicated following of fans who cried out upon its cancellation in 1969, but it wasn't originally the phenomenal legend that it is today. It wasn't until after the moon missions and syndication that STAR TREK really "took off". This was due to the public's changed perceptions that space travel was indeed not only possible but practical. Since the early seventies,

STAR TREK has only gained more and more fans.

STAR TREK also had a strong influence with the public's perception of computers. It showed that computers would become an integral part of our future. Computers soon would be used in most all aspects of our lives. Also, it taught that this wasn't a bad thing, but a useful tool to make our lives easier and more productive. In STAR TREK, members of the crew only had to talk to the computer to interact with it. That technology is now being used today, though it is not quite as perfected yet.

In the 1960's, computers were still tools of scientists, engineers, the government and large businesses like banks and insurance companies. Normal people couldn't really see a need for owning a "personal" computer. In fact, at the time, the concept of owning your own computer wasn't considered by even people who had access to a computer. The idea of "time sharing" had only just begun. In many universities, students were "hacking" away on terminals connected to mini-computers. Even in STAR TREK there were no individual computers anywhere on the ship, only tie-ins to the central computer. But access is the main theme here. STAR TREK showed that anyone could have access to a computer system. That is the idea that inspired many a

blooming computer pioneer.

By the late '60s, a text adventure of STAR TREK could be found hidden away on almost every mini-computer in the country. There were literally dozens of versions and even different versions for the same machines. Those "hackers" who could make the game better, did and then freely returned their work to others to enjoy. STAR TREK was one of the first and most popular computer games.

What was it and still is about STAR TREK and "computer people"? I think it is an agreed attitude about the future. STAR TREK gave us and still continues to give us hope for the future. It isn't a negative journey, but a positive one. In the future, people of all races and kinds can get together and get along. It isn't a perfect future, but we do not self destruct. The early men and women who helped bring the personal computer into being shared in that vision. The future was bright and everyone can be equal and share in a powerful new tool. The computer should no longer belong to an elite core of persons in white robes and ID cards. Early computer enthusiasts and STAR TREK fans were dreamers.

Within a few months after the introduction of the Altair and the initial release of BASIC in 1975, STAR TREK found its way to hundreds of users. Almost as quickly as new computers were introduced, the game was transferred over to them. People loved their new dream machines and they wanted to experience the thrill of STAR TREK through them.

My first experience with a computer was also in 1975. I was 10 years old and in the fifth grade. My class took a field trip to the local university and was oriented in their computer lab. Two and three of us were sat down at what looked like huge typewriters and we waited. All at once the roomful of devices began to clatter away. By using successions of letters, they printed in big letters a welcome to the lab and told us about it. So far I thought it was pretty cool just that the typewriter was typing on its own. What really blew me away though was when the thing asked me

for my name. I slowly typed my name in and then the terminal printed it super big - "HELLO DAVID!" I couldn't believe it, the computer had learned my name. I was hooked! After the little introduction, the computer told us (my classmate Thomas and me) that we were going to play a game against it; you guessed it - STAR TREK! It printed a page of instructions with the corresponding buttons and letters for action: firing phasers, firing photon torpedoes, shields up, warp drive, sublight cruising, etc. So we took charge of the Enterprise and encountered a Klingon cruiser on patrol. They of course fired without warning and we were hit a few times. Then we figured out how to use the headings that were given for us and the Klingons. In the end, we still had 70% of our hull left and we completely blew away the bad guys. (A real positive future huh? Maybe I better rethink that one.)

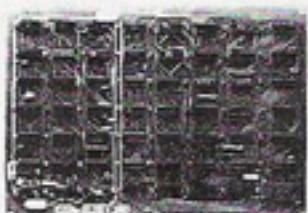
It was a great day in my childhood. I kept that printout for at least 2 or 3 years after that. I wish I still had it to look at now. At the time, I always liked STAR TREK, but it wasn't that big of a deal to me. After our trip, my attitude towards STAR TREK stayed at about the same level, but I began dreaming about the future and about using computers one day. I always thought to myself that when I grew up, I wanted to do something that included the use of computers. I guess I've found my niche. In the words of the Enterprise's computer -

"W O R K I N G."

## T.V. TYPEWRITER

Part no. 106

- Stand alone TTV
- 32 char./line, 16 lines, modifications for 64 char./line included.
- Parallel ASCII (TTL) input
- Video output • 1K on board memory
- Output for computer controlled cursor • Auto scroll • Non-destructive cursor
- Curser inputs: up, down, left, right, home, EOL, EOS • Scroll up, down • Requires +5 volts at 1.5 amps, and -12 volts at 30 mA • All 7400, TTL chips • Char. gen. 2513 • Upper case only • Board only \$39.00; with parts \$145.00



RUN

### BASIC

```

100 PRINT "FAHRENHEIT TEMPERATURE?"
110 INPUT F
120 LET C=(F-32)/59
130 PRINT "CENTIGRADE TEMPERATURE.",C
140 PRINT
150 END

```

INPUT

### PASCAL

```

PROGRAM TEMPERATURE;
VAR FAHRENHEIT, CENTIGRADE: REAL;
PROCEDURE CONVERT;
BEGIN
  CENTIGRADE := (FAHRENHEIT-32)*59;
  WRITELN ('CENTIGRADE TEMPERATURE IS.','
    CENTIGRADE)
END;
BEGIN
  WRITE ('FAHRENHEIT TEMPERATURE: ');
  READ (FAHRENHEIT);
  CONVERT
END

```

BEGIN

NEXT

STEP

GOSUB

FOR

### C

```

/* program prints a conversion table from
   Fahrenheit to centigrade in steps of 5 degrees,
   from 50 to 100 degrees Fahrenheit */
main( )
{
  int lower, upper, step;
  float fahr, cent;
  lower = 50; /* lower limit of table */
  upper = 100; /* upper limit of table */
  step = 5; /* size of steps in table */
  fahr = lower;
  while (fahr <= upper) {
    cent = (5.0/9.0) * (fahr-32.0);
    printf ("%4.0f%6.1f\n", fahr, cent);
    fahr = fahr + step;
}

```

## Programming Languages Compared & THE HISTORY OF TODAY'S BIG 3.

### BASIC - (Beginner's All-Purpose Symbolic Instruction Code)

Designed by John Kemeny and Thomas Kurtz at Dartmouth College as a learning language which would be "so simple that students could use it after three hours of training." It was originally designed as an interactive timesharing language for mainframes, but became the most widely used language for all sizes and kind of computers.

**PASCAL** - In 1951, Grace Murray Hopper, a pioneer programmer, wrote the first compiler (a programming tool to construct other programs) which triggered a whole new field in programming languages. A problem arose because there was no order or consistency in the many new languages. Computer scientists all over the world labored to create a standard. ALGOL was born in 1960, but failed as a universal language. **PASCAL** was named for Blaise Pascal, the 17th century French mathematician and calculator maker by Swiss programmer Nicklaus Wirth in 1971. He took ALGOL and substantially improved it by adding the principal of "structured programming" into the design.

**C** - In 1963, a group of English computer scientists dreamed up a language called CPL (Combined Programming Language). It was a unique design. It could be machine-independent and easy to use, plus it had features resembling assembly language which allowed a programmer to manipulate individual bits of data. It seemed to be the perfect computer language except for one small detail . . . it didn't work! During the next 9 years, CPL was turned into BCPL and then into just B with attempts to make it into a practical language. It wasn't until 1972, when Dennis Ritchie took a try, that B evolved into today's modern C. Dennis Ritchie wrote the operating system UNIX in C. C is the programming standard today by having just the right combination of high- and low-level programming language functions.

# G The U Graphical User I Interface

by David Greenish

**The "not as new as you might think" idea that took four decades to really catch on!**

## Where it All Began

Who created the GUI? Of course everyone knows that Apple Computer invented the graphical user interface and introduced it to the general public with the release of the Apple Macintosh back in January, 1984, right? Oops! Uh . . . actually no. Ok, ok. Microsoft invented it with those crappy early versions of Windows? No again. Really, the first practical interpretation of a GUI (you can say "goopy" if you want) should be credited to none other than Xerox Corporation's Palo Alto Research Center (PARC). It was their visionary approach to computing which generated what is today a standard not only with Macintosh users, but also with IBM compatible users as well. In 1971, three years before even the simplest hobbyist computer kits appeared in electronic magazines, PARC had begun work on an intuitive computer which would work like people did in an office scenario. Though Xerox made a graphical

computer "desk top" scenario real, our story must begin with some earlier writings and developments which substantially influenced PARC. Our history begins over forty years ago . . .

## The Memex Machine

Back in July of 1945, near the end of World War II, a designer of early calculators and a science advisor to President Roosevelt named Vannevar Bush, published an article called "As We May Think" in the Atlantic Monthly. Mr. Bush discussed his concepts of current electronic technology and predicted where the field was headed. At a time when computers were new, huge, and used only by the military, Bush envisioned a computer that would store and manipulate words and pictures, not just numbers. He once said, "The world has arrived at an age of cheap complex devices of great reliability and something is bound to come of it." He envisioned a smaller device that was designed for personal use. He predicted that one day a computer he called a Memex would, "consist of a desk, and while it can presumably be operated from a distance, it is primarily the piece of furniture at which a person works. On top are slanting translucent screens on which material can be projected for convenient reading. There is a keyboard, and sets of buttons and levers. Otherwise it looks like an ordinary desk."

Bush never tried to build his machine. The technology to bring his ideas to life wouldn't exist for many more years. He was too far ahead of his time. For the next fifteen years, computer engineers refined the technology of room sized, batch fed, number crunching electro-calculating computers.

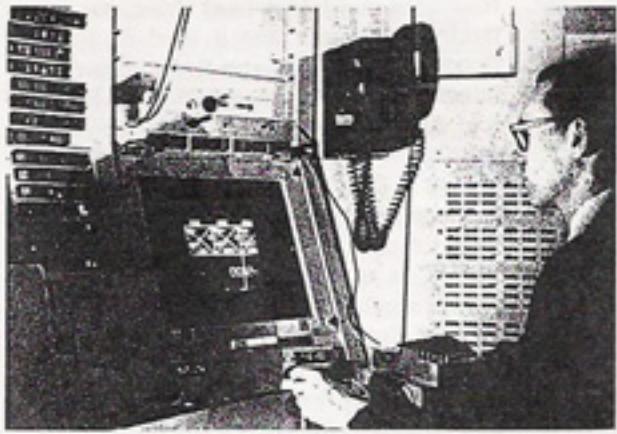
## A Personal "Man-Computer Symbiosis"?

In 1960, a computer scientist named J. C. R. Licklider was chosen to head up a new division of ARPA (the Advanced Research Projects Agency). ARPA was a government funded organization whose researchers asked, "How might computers be shaped to the needs of individual users?" This was an unusual and fresh undertaking for the time. Licklider was to head up the Information Processing Techniques division. Shortly before assuming his position with ARPA, he wrote a paper called "Man-Computer Symbiosis." The paper had many similarities with some of Bush's ideas, but Licklider interpreted the ideal future of computing as a new relationship between man and computer and not just with new types of hardware. He wrote that a person should be able to "think in interaction with a computer in the same way that you would think with a colleague whose competence supplements your own."

Mr. Licklider was able to turn some of his visionary ideas into reality. He channeled the agency's money into projects which helped make interactive computing a reality. His division developed the concept of timesharing, which allowed many people to share a multi million dollar computer at the same time. Alas, early "hackers" were born as well.

## Sketchpad

Around 1962, an MIT graduate student named Ivan Sutherland thought hard about interactive computing. He developed an interactive graphics program called Sketchpad for his Ph.D. thesis. The program allowed a user to manipulate



## SKETCHPAD

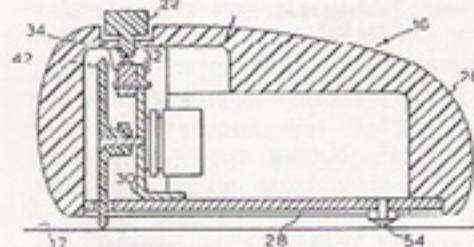


FIG. 2

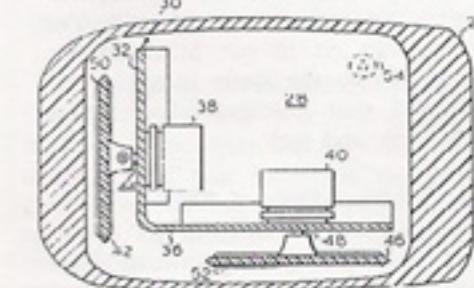
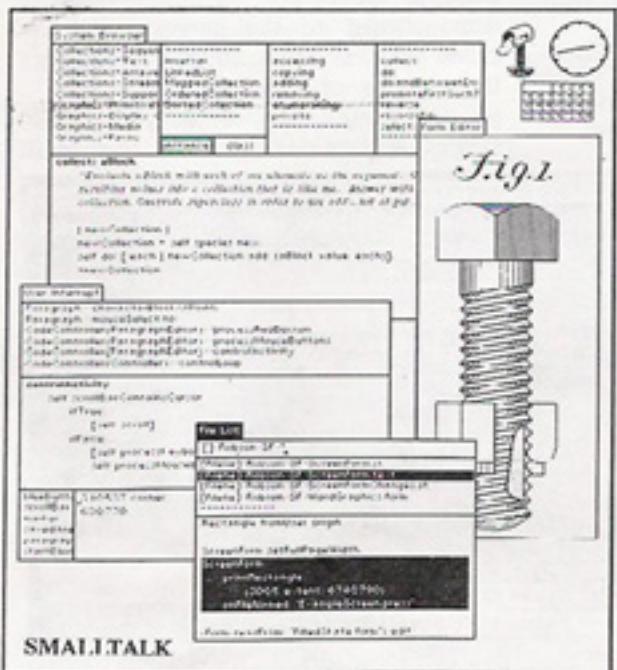


FIG. 13

THE  
FIRST  
MOUSE



geometric shapes on a CRT display using a light pen. The shapes were then treated as objects which could be moved, copied, shrunk, enlarged expanded, rotated and even joined together to create a more complex object. This piece of software is the true grand daddy of the modern GUI and directly influenced future concepts of interactive computing. contained many of the general concepts which Kay would bring to reality with his team later at Xerox's PARC. He was interested in changing the general public's attitude about computers. He wanted to not only create a computer which was interactive, but intuitive. He also dreamed about his idea of the perfect computer called the Dynabook. A

## The NLS

ARPA was also responsible for backing the work of a man named Douglas Engelbart, who established a research program at Stanford Research Institute for exploring the use of computers "to augment the knowledge worker." His team experimented with different types of input devices and pointing instruments and then in 1964, Engelbart invented the "X-Y Position Indicator for a Display System," which was simply the first mouse. He and his colleagues also developed an entire system which became known as NLS (an acronym for oN-Line System). NLS was unique in many ways. It used a CRT display screen while other computers used teletypes. It also had a full-screen-oriented, mouse driven graphical interface which organized both text and graphics into a tree-like file structure. It could be said that it had a crude form of Hypertext.

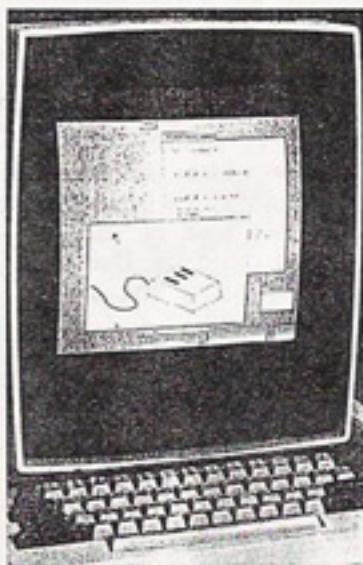
The Reactive Engine, Dynabook  
& FLEX

In 1968, Engelbart gave a very interesting demonstration of the NLS at a computer conference in San Francisco. One of the many people who were impressed with the demonstration was a man named Alan Kay. Kay, a graduate student at the University of Utah, wrote his dissertation about an interactive computing system called "The Reactive Engine." This paper

contained many of the general concepts which Kay would bring to reality with his team later at Xerox's PARC. He was interested in changing the general public's attitude about computers. He wanted to not only create a computer which was interactive, but intuitive. He also dreamed about his idea of the perfect computer called the Dynabook. A computer about the size of a large book, which cost less than \$1000, was easy to use and as powerful as a mainframe. The Dynabook never came to be, but Kay and a colleague named Edward Cheadle did build a stand-alone computer called the FLEX machine. It had multiple windowing, good graphics and used a pointing device, but was difficult to use and Alan Kay still aimed for a better system.

In 1970, Xerox Corporation opened its Palo Alto Research Center and hired Bob Taylor, the current ARPA administrator, to head the Computer Sciences Lab. Taylor hired Alan Kay as one of his researchers for the *Learning Research Group*. He also hired several people who had worked with Engelbart on the NLS. This group of visionaries were dedicated to the dream of creating an interactive "personal" computer. They even coined the term "personal computer". In 1971, the center acquired licensing to use the NLS mouse and went to work. Kay knew that the technology to develop his Dynabook was not available, but was determined to pursue the goal anyway. PARC researchers were fond of the saying "The best way to predict the future is to invent it," and Kay believed, "a personal computer is 90 percent software." In 1972, Alan Kay created a new programming language and environment called Smalltalk. It pioneered a complete interactive object-oriented environment which took advantage of bit-mapped displays.

windows, mouse driven input and even multitasking.



The Xerox Alto

Well . . . this is the computer that pioneered that "user-friendly" interface that you know and love today.

Developed at PARC (the Palo Alto Research Center), the Xerox Corporation's Alto computer was the first computer to utilize the mouse/icon environment. Designed in 1972, it had 128K of RAM! (As much as or more than most minicomputers had at the time) It used a bit-mapped 608 x 808 pixel, 81/2" by 11" black on white display screen and a 2.5 MB removable cartridge disk. It also could be used with a laser printer, plus it connected directly to an Ethernet network. (Where can you get one of these 20 year old computers for your network you say?)

The Alto was primarily created in order to support further software development. Chuck Thacker and another technician built the system in only four months! The Alto was the first computer to not have its interface built into the hardware. The interface could be changed with software. The Alto used Kay's operating system and language Smalltalk and a word processor named Bravo.

The Alto is arguably the first personal computer. (Though most

computer historians consider the Altair 8800 introduced in late '74 as the first true personal computer kit.) Nearly 1000 Altos were in use by 1979.

The Alto was a giant step ahead in personal computing in the 1970's. It might have succeeded, but it suffered from a very expensive price tag (\$15,000 just to produce it) and a lack of software. Its revolutionary qualities were used to develop other Xerox systems as well as the Xerox Star workstation. The Alto was the computer that could have changed the world - but didn't.

#### The Xerox Star

The Xerox Corporation formally introduced the "desktop" user interface with the 8010 "Star".



Workstation in 1981. This computer

also incorporated the WYSIWYG (What You See Is What You Get) display and printing technology.

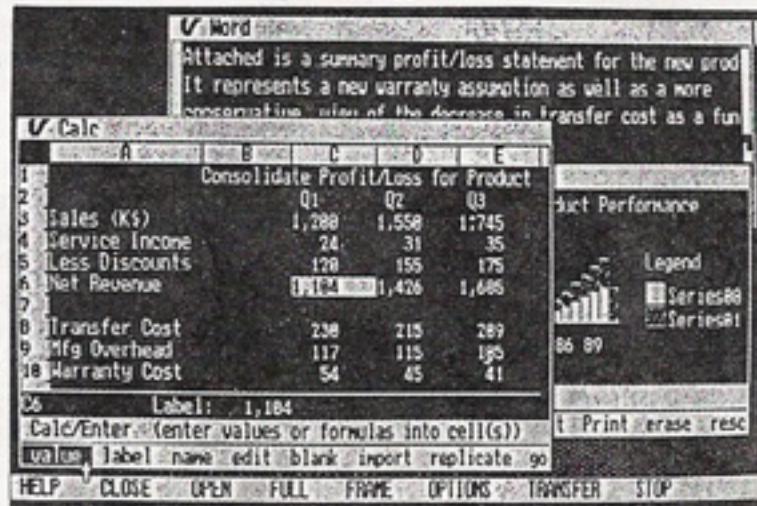
Basically, the Star was a bigger and better version of the Alto. It had more memory than the Alto with 384K of RAM, a clearer 17" display with a higher

resolution, a 10 MB hard drive, a mechanical mouse and it used 8" floppy disks. It was the first fully integrated graphics based system. It sold for \$16,500 with software. To develop Star and other office systems products, Xerox created the *Systems Development Department*. The Star was not directly developed at PARC.

It was the Star prototype and Alto running Smalltalk that inspired Apple's Steve Jobs to start the Lisa project at Apple and caused Bill Gates to consider "Windows" at Microsoft near the end of the 1970s. Steve Jobs had seen the Star demonstrated while visiting PARC. He was able to talk some of PARC's key engineers into coming over to Apple to work on the Lisa and Macintosh projects. Much later, after the success of the Macintosh, Xerox sued Apple for stealing their ideas about graphical interfaces. It was ruled that an idea or concept could not be copyrighted. Pretty good for Apple huh? Yet Apple went on to sue Microsoft for doing exactly the same thing! Apple contested that Microsoft had stolen their "look and feel".

#### The Graphical Fury of 1982

At the 1982 annual Fall Comdex convention, a new and unique software product was demonstrated to the general public called VisiOn. Produced by VisiCorp, the creators of VisiCalc, VisiOn was an integrated set of graphically oriented applications. It used a mouse,



did windows and WYSIWYG high-resolution graphics. It more than amazed thousands of convention goers and even awed Bill Gates of Microsoft. This led him to start development back at the shop on the "Interface Manager" which later became Windows. "Enter VisiOn. Suddenly and without warning, your personal computer becomes everything you actually bought it to be," is a quote from an ad in February 1984. But VisiOn was still just a demo in 1982. It wasn't until late '83 that the software became available to consumers. VisiOn didn't succeed because it cost nearly \$1,800 by itself and needed an XT with a hard drive and 512K of RAM in order to run. These were tough requirements in 1983. Other unsuccessful entries into the GUI arena were DESQ by Quarterdeck Office Systems and GEM by Digital Research.

#### The Apple Lisa

Introduced in February 1983, the Lisa computer received quite a fan-fare from electronic and computer magazines. It was hailed as the next generation in ease of use. Though most of its interface was "borrowed" from Xerox, the Lisa did a lot to improve on the basic concepts as well as introducing the one button mouse and the first integrated application software.

The original Lisa computer had a full "meg" of RAM, 16K of ROM and two 5.25" "twiggy" drives. It used a 5 MB external hard drive called the "Profile" which sat up on top of its case. The screen was 12" diagonally with 364 lines by 720 dots per line resolution. It is interesting to

mention that the Lisa had rectangular pixels instead of square ones. The Lisa can be somewhat considered the prototype for the Macintosh. Its operating system was not quite as refined as the Macintosh, but the Lisa's ROMs did contain a lot of the code that was later to be used on the Mac. Like the Mac, Lisa also used a Motorola MC68000 microprocessor running at approximately 8 MHz. The second generation of Lisas which were released shortly before the release of the Mac were known as Lisa2s. They had a 400K single sided 3.5" disk drive and an internal 10 MB hard drive.

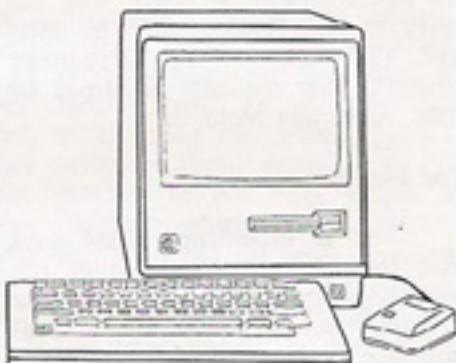
The Lisa did have a small excited following for a short time, but it was apparent that its \$10,000 price tag made it too impractical for even serious corporate buyers. These events occurred almost two years after the introduction of the IBM PC which cost about three times less.

Almost immediately after its introduction, Apple kicked the Lisa to the sidelines to better continue work on another project - A computer for the rest of us with all the features of the Lisa for around \$1,000. (It didn't happen!) Around early 1985, Apple renamed the Lisa - the Macintosh XL. It was sold with a program called "MacWorks" which allowed it to emulate a Macintosh. Sales were fair.

#### The Macintosh

Formally introduced in January 1984, the Macintosh received a huge response from its Superbowl half-time television ad. In the ad, "Big Blue" (IBM) was made out to be like Big Brother from Orwell's novel 1984. The "computer for the rest of us" had arrived to set us free.

The original Macintosh had 128K of RAM. It used the Motorola MC68000 chip running at approximately 8 MHz. It had 32-bit internal registers and a 24-bit address bus. It had 64K of ROM, couldn't use a coprocessor and the memory was not upgradable because it was soldered directly to the motherboard. It had a unique cabinet design: a semi-portable.



box like, self contained unit with a built in 9" black on white 512 by 342 pixel display. One 3.5" 400KB disk drive, two serial ports and a four-voice sound generator. A one button mouse and a 94 key keyboard. Macintosh came bundled with two software packages called MacWrite and MacPaint.

The Macintosh became a very popular computer almost immediately. Apple had hoped to sell 50,000 machines within the first 100 days, but dealers moved more than 75,000 Macs during this time. (Most at the full \$2,495. list price) The Macintosh wasn't taken seriously by business users and never approached IBM's lead, but it did define ease of use and became the standard for GUIs.

By the Mac's first birthday in January 1985, roughly 70% of Apple's revenue was still coming in from the Apple II line. Mac sales had slumped, but just in time, Apple introduced the LaserWriter. "Desktop Publishing" was born and the Mac was saved. This is the area where the Macintosh defined another standard.

#### Windows & OS/2

Well . . . what can I really say about the history of these products? Until relatively recently, neither was widely used or taken seriously. But now, Microsoft Windows 3.1 is the standard of DOS based GUIs. At least 70% of all new software is being written for Windows.

IBM's OS/2 2.1 (co-developed by Microsoft) is finally making a serious grab at the market. Hailed as the only true 32 bit DOS operating system, it is a far second to Windows.



It's future should be bright with the entry of the Pentium chip by Intel and the soon to be introduced PowerPC chip mutually developed by IBM, Apple and Motorola.

#### The Future

It is established these days that the future holds more of the same. Most typical home and business computer users prefer a graphical interface. These systems just make computing a whole lot easier. But, the original concept was "interactive" computing and not just graphical. These goals are being pursued in numerous research facilities all over the world. In fact, it is not unreasonable to expect practical voice and writing recognition systems on the market by the end of the year. The next wave of personal computing is the era of pen-based communicators. Is the Memex here yet? How about the Dynabook? Have you seen one?

# Watch Your Husband!

*for the first Signs of NERVOUSNESS*



It has been said a man's success depends more on his wife than any other one factor. The "successful" wife watches her husband's health like she does that of her children. At the first sign of Nervousness or Irritability—the wise wife suggests Dr. Miles' Effervescent NERVINE Tablets.

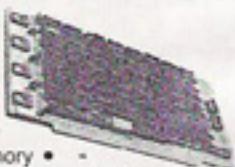
When your husband comes home weary and despondent—when he is troubled with Nervous Headaches, Sleeplessness or Nervous Indigestion, try Dr. Miles' Effervescent NERVINE Tablets. They make a sparkling, refreshing drink that quickly soothes overwrought nerves. They will soon make him feel his happy, good-natured self again.

DR. MILES' Effervescent  
**NERVINE**  
TABLETS  
At all Drugists.  
25c and \$1.00 Packages.



## The XEROX Palo Alto Research Center

### 8K STATIC RAM



Part no. 300

- 8K Altair bus memory •
- Uses 2102 Static memory chips • Memory protect • Gold contacts • Wait states • On board regulator • S-100 bus compatible • Vector input option • TTL state buffered • Board only \$22.50; with parts \$160.00

### RF MODULATOR \*

Part no. 107

- Converts video to AM modulated RF, Channels 2 or 3. So powerful almost no tuning is required. On board regulated power supply makes this extremely stable. Rated very highly in Doctor Dobbs' Journal. Recommended by Apple. • Power required is 12 volts AC C.T. or +5 volts DC • Board \$7.60; with parts \$13.50



PARC was established in 1970 by Xerox to compliment its main research facility at the time, Webster Research Facility in New York. The new center was designed to expand Xerox's role beyond reprographics and into information handling and communications. It would provide the technologies for the company's future office information products. Peter McColough, the president at the time, wanted Xerox to expand and become the "architects of information" for the business office. PARC has focused its work on how to make managing information more convenient and effective for usrs.

PARC occupies a 200,000-square-foot facility in the Stanford University Industrial Park in Palo Alto, California. It was located near Stanford University in hopes that it would attract outstanding technical talent.

PARC founders believed that modern information technology would be built on both the information sciences and the physical sciences. Staffed with nearly 250 researchers, PARC has talent ranging from computer science technology to psychology, microelectronics to programming languages, and network architecture to linguistic theory.

Numerous concepts and achievements have originated at PARC. Among them was the development of the modern workstation on a fully distributed network. These computers commercially introduced bit-mapped displays, windowing, icons and the mouse. Related development included Ethernet, now an industry standard. No other private research center anywhere has contributed as much to the modern information age as Xerox PARC.

# Book Review

## **Whatever Happened to the Classics?**

Stan Veit looks back on his years running the Computer Mart of New York.

"From Altair to IBM," Stan Veit recollects about the machines he sold and the people he met in his store from the mid to late 1970s. He also covers computers of the early '80s and tells the story of IBM's introduction of the PC in 1981 and what happened to the competition. It is an interesting and personal account of the developmental years of personal computing.

### **STAN VEIT'S HISTORY OF THE PERSONAL COMPUTER**

by Stan Veit, Editor-in-Chief Emeritus of Computer Shopper

\$19.95 soft cover & \$27.95 hard cover

WorldComm  
65 Macdonia Road  
Alexander, NC 28701  
1-800-472-0438

Actually, the book is an expansion of his articles from the Computer Shopper where he has a monthly column entitled *What Ever Happened to ...*. It is a collection of individual short computer stories. This is nice because you can jump around and read about the computers which interest you most first. You will get around to reading them all though and not one is uninteresting. The facts are straight forward and Mr. Veit presents technical information in a way that does not intimidate nor insult. But the exciting portions of his book are his interactions with the people in his store and some famous people who he met and worked with. He met and helped Steve Wozniak and Steve Jobs with their early Apple and Mr. Veit's wife even forced Steve Jobs to let her patch a hole in his jeans at a show! Charles Tandy paid a visit to the Computer Mart as well.

This book is a must for the computer history buff. Stan covers - Altair, IMSAI, SWTP, Sphere, Apple, Cromemco, Ohio Scientific, Processor Technology, the digital group, Radio Shack, Commodore, Atari, T.I., North Star, Osborne, Vector Graphics, Polymorphic, Heath, Morrow's, Xitan, IBM and some others you may have never heard of!

# Letters Page

OK, so it's not a whole page and we only have one letter to print, LOOK quit harassing me and get those letters in now! We want to hear from you. Send to:

*HCS Letters*  
**10928 Ted Williams Place**  
**El Paso, TX 79934**

Dear HCS,

My association with "antique" computers has been somewhat brief so far: In May 1992, I bought a Kaypro II at a flea market. Soon after I procured the software and documentation I needed, the machine malfunctioned. After trying to fix it myself, I shipped it off to Florida to an expert who proclaimed it dead (the main board was cracked).

Meanwhile, my employer went bankrupt, and during their liquidation, a 1984 IBM AT became available to me, replete with a truckload of software and extras, and thus began my migration from CP/M to "classic DOS".

In a time when the public is being bamboozled into believing that they must spend all their cash on blindingly fast, giga-memory, multi-media behemoths in order to achieve the PC equivalent of "keeping up with the Jones", it is refreshing to find organizations that recognize (1) how relatively useless these beasts are to the great majority of users (sans CAD-artists, aerospace engineers, and the like), and (2) that the older, basic nuts-and-bolts type machines, marketed in their time as "personal business computers", can accomplish virtually the same tasks, albeit a few microseconds slower (who cares?) and sans all the bells and whistles.

It is also refreshing to hear this old iron referred to as "antique" as opposed to outdated junk. Why shouldn't old computers achieve the same classic status as other articles of America's past?

Sincerely,

*Erroll Foldes*  
Briarwood, NY

# Antique Parlor

## The Altair

Leslie (Les) Solomon was the Technical Editor for *Popular Electronics* during the summer of '74 and he was looking for a good computer article and project to print. Both he and Editorial Director Arthur Salsberg wanted to publish a piece on building a computer at home. Solomon had received some articles, but they were not what he was looking for. "A rat's nest of wires," as he would describe them. But Solomon encouraged his writers to send in their best ideas.

Ed Roberts was one of "Uncle Sol's" writing contributors. A man who loved to fool with gadgets and electronics, Roberts started a small electronics company in Albuquerque, New Mexico in 1968. MITS (Micro Instrumentation Telemetry Systems) mostly sold radio transmitters for model airplanes through the mail. But, by the early 70s, MITS was selling calculator kits and doing fairly well.

At the end of 1973, the calculator market changed drastically, other companies were selling fully assembled calculators for below \$50, while Roberts' kits were \$99.95. He had to think of something quick or go broke. He had toyed with the idea of developing a computer kit before, but never followed up on it. Now, he decided to go for broke. If this didn't work, then he would just close up shop.

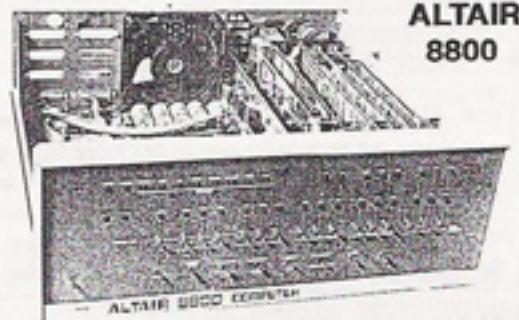
Roberts decided on the Intel 8080 chip for his project, rejecting the older 8008 and new 6800. He was able to get an excellent deal on the chip in volume - \$75 a piece for a \$360 chip! By mid-1974, Solomon had decided on supporting Roberts' article and kit. He staked the reputation of *PE* on the expertise of MITS. In July 1974, *Radio Electronics* had published an article on a 8008 based computer kit called the "Mark-8". Les Solomon needed an 8080 based project to beat out *RE*.

MITS worked feverishly on the computer, creating an expandable main circuit board that had a data bus with 100 separate paths. It was capable (in a miniature way) to do anything that a large mainframe computer could do. Les Solomon's daughter, Lauren, gave it its name "Altair" because that was where the Enterprise on *STAR TREK* was going that night. He had asked her for a name idea and had asked what they called the computer on *STAR TREK*? "Computer," she said. Altair was the better name.

The Altair kit appeared on the cover of the January 1975 issue of *Popular Electronics*. In kit form, MITS offered the basic model with 256 bytes of RAM, standard binary switchos and LEDs on the front panel and power supply for \$400. Hoping to sell around 200 kits, Ed Roberts and MITS were overwhelmed to receive thousands of pre-paid orders. Electronic hobbyists were willing to have paid the

\$360 just for the chip itself, so why not get an entire computer for \$400? It took MITS almost a year to catch up the orders. Over 10,000 Altairs were sold by MITS.

The Altair was the first commercially successful computer ever. It started the personal computer revolution which has since consumed our planet. Imagine the world just 18 years ago when there wasn't a computer in every pot.



## Cromemco

They were the "Specialist In Computer Peripherals." Known for reliable and useful products, Cromemco was started by two Stanford University graduate students named Harry Garland and Roger Melen. They had been two of "Uncle Sol's" contributors for *PE*. One morning in 1975, they were visiting Solomon and showing him their newest project called the "Cyclops" TV camera. Les Solomon showed the two men the Altair and they were hooked on computers forever more.

On their way back to California, Garland and Melen stopped by MITS HQ. They convinced Ed Roberts that they were just the men who could develop a video board for the Altair. Though considerably backed up with orders, Roberts allowed them to take an Altair. Thus, Cromemco was born - named for their beloved dormitory at Stanford, Crothers Memorial Hall.

Cromemco's first product was an excellent plug-in EPROM board (Erasable Programmable Read-Only Memory) called the "Bytesaver". It cost around \$200 in kit form. Their next endeavor was a graphics board called the "Dazzler". The Dazzler could send a vector-generated color signal to a standard color TV set. They also sold software to take advantage of this wonderful new product. One of their most impressive wares was called the "Kaleidoscope" which looked like a rotating color kaleidoscope on a color TV. It was a work of art at a time when computers used teletypes.

Cromemco continued to expand its product line

with Altair compatible S-100 plug-in boards and developed a Z-80 CPU board. The next step was to complete an entire computer. The two men bought an IMSAI computer (an improved Altair compatible) and installed their own ZPU board, I/O boards and memory boards. The computer performed noticeably better and they called it the Z1. The Z2 was Cromemco's first totally in-house produced computer. It had a large, extremely sturdy metal case, Z-80 CPU, shielded S-100 bus and 21 expansion slots. You could even purchase an 11 MB hard drive for it.

Throughout the 70s and early 80s, Cromemco continued to expand and improve their computer and peripheral line. Cromemco was one of the last S-100 computer manufacturers to fall to IBM. IBM's entry into the personal computer market in 1981, destroyed many of the earlier non-DOS machines.

## - Historically Brewed Classified -

For a limited time, we are offering free classified advertising for subscribers of HB. Size of ads are left to the discretion of HB. Ads can be of a business nature, equipment for sale, trade or contacts. Send to: HCS Classifieds - 10928 Ted Williams PL - El Paso, TX 79934.

Please enjoy these reprints of classified ads from a computer magazine of 1983.

### SOFTWARE

**FREE SOFTWARE DIRECTORY** Database manager mailing list, inventory, accounting, payroll, TRS-80, xerox, IBM-PC. Long SASE. \$74. Micro Architect, 96 Dothan, Arlington, MA 02174. 617-643-4713.

**VIC-20 TRS 80 SOFTWARE, HARDWARE**—Morse code, RTTY, EPROM, programmer memory FRANKLYMAN, P.O. Box 3091, Nashua, NH 03061.

**ATARI, APPLE, IBM-PC: Extensive line-educational, entertainment, business. FREE BROCHURE.** New Dimension Software, 39010 Baroque, Mt. Clemens, MI 48044.

**TI-99/4A PROGRAMMERS:** Affordable Software Catalog, only \$1. PROGRAMS SOFTWARE, 1435 Burnley Square North, Columbus, OH 43229.

**GUARANTEED LOWEST SOFTWARE PRICES FOR ALL SYSTEMS!** Write for quotes and FREE CATALOG. Specify systems, N.Y.S.E., P.O. Box 722, Newtown, PA 18940.

**TI-99/4A SOFTWARE.** Free price list plus newsletter. Glen Doss, Box 801CC 1, Santa Maria, CA 93455.

**VIC-20/COMMODORE-64 Educational Software** designed by teachers. Free catalog. ATHENA SOFTWARE, 727 Gwinnett, Newark, NJ 07101.

**ATTENTION: TI-99/4A; SINCLAIR TS/1000; COMMODORE VIC-20/64; APPLE; ATARI 400/800 USERS!** Super Software Selection. Send \$1.00 for CATALOGUE. State make, model, Alpha Software, 162 Chapel Drive, Churchville, PA 16900.

**ULTIMENU FOR DOS** simplifies IBM's, PC-DOS to meet your needs. \$24.95. DB/DC Software Associates, P.O. Box 4699, Manchester, NH 03102.

**TI-99/4A owners.** Send for free list of new and exciting, low cost software. DYNAMO, Box 124, Hicksville, NY 11801.

**CHECK OUR SOFTWARE PRICES FIRST!** Business-Education-Games for all popular computers. Free brochure. LOG-ON, Box 747, Winchester, CA 92396. (714) 926-1141.

**FLOPPY DISK** for Apple, TRS-80's, Commodore's, Atari's, IBM's, etc. — 10 disks/Box \$5/DO BASF/\$20.00-Wabash/\$20.00-Scotch/\$23.00-Memorex/\$25.50-Mail-\$28.00-Dyman/\$35.00—Dynamite disk and 8" also available. Shipping \$2.50/Order, Add N.J. sales tax if applicable. COMPUTER DISK, 24 Washington Ave., Lake Hiawatha, NJ 07034.

**FREE EDUCATIONAL SOFTWARE CATALOG** — Pet, Commodore 64, Apple II+, TRS-80—Island Software, PO Box 300, Dept. G, Lake Grove, NY 11755. (516) 585-3755.

**AIR NAVIGATION TRAINER** — The most realistic program available for learning flight navigation. \$40. (Apple). Space-Time Associates, 20-39CC Country Club Drive, Manchester, NH 03102. (603) 625-1094.

**VIC-20, COMMODORE 64, TI, Spreadsheets, File Manager, and other business programs.** None more than \$19.95. For details: VALORUM, 441 Clydo Ave., Mountain View, CA 94043.

**APPLE & ATARI**—Software, Hardware, books, educational, etc. Great prices, outstanding service. Vulcan Software, 1805 Caulier Rd., Birmingham, AL 35209.

**MINI-SCRIPT WORD PROCESSING SOFTWARE**—All you need to write letters/reports! Features include justification/edit. TRS-80 Mod III only. Cassette \$9.95. Disk \$14.95. Hundley Enterprises, 4040 Malat Street, Oakland, CA 94601-1989.

**VIC20 and C64 SOFTWARE**: Special—Eighty VIC20 Programs on two cassettes, \$15.95. Postage \$1.50. Public Domain. SASE to FANFARE SOFTWARE, 120 E. Main, El Cajon, CA 92020.

**APPLE-ATARI-COMMODORE SOFTWARE**: Price list \$1.00. Please specify which computer. 20/20 VIDEO, Box 60132-A, Chicago, IL 60650.

**ATARI SOFTWARE**: Discount prices. Free catalog. LeMont Software, P.O. Box 473, Herndon, VA 22070. (703) 620-3655.

**HANDICAPPING PROGRAMS FOR MOST PERSONAL COMPUTERS**: Free Catalog: Gambler's Edge Computing, Dept B4, 266 Richards Rd., Suite 264, Kansas City, MO 64116. 1-800-821-3343. 1-816-471-8660.

**UNIQUE WPL program for use with Applewriter.** Includes WPL program, zip code sort, search program for user specified word/item/phrase. Complete printable documentation on disk and usable demo program. Specify Apple II-IIe/IIc/III. Send \$26.95 to New Horizons, Box A655, Medford, Oregon 97501.

**COMMODORE 64, VIC-20, 20-4/A, SINCLAIR, and ATARI software.** Free catalog. Excaliber Enterprises, Dept. C2, Box 20093, Riverside, CA 92516. (714) 359-8567.

**FREE money saving bulletin on popular brand name programs and tools for your small computer.** Superior, Dept. CR, 8030 Westchester Road, Westchester, OH 45069.

**PUSH-IT\*** Assists Income Tax Preparation, Budgeting, Bookkeeping, Check Book Summaries, Credit Card Summaries. Simple and Accurate. BASIC program in spiral bound pamphlet. \$20 postpaid. WOODSON Products, 700 Madras Lane, Charlotte, NC 28211 (704) 364-7634.

**X-HAI 10 X BASIC ADOS PM GRAPHICS**, String arrays, 30 new functions to Atari Basic \$329.95. HDUS gives named file handling, DOS 2.0 compatibility to APX, ng-FORTH 30.95. Superware, 2020 Kingshouse Road, Silver Spring, MD 20904. (301) 236-4450.

### HARDWARE

**NEC and OKIDATA PRINTERS, AMIDEK MONITORS, Free Price List, Lowest Prices!** Tech-Systems, P.O. Box 550, Spring, TX 77383.

**FREE DISCOUNT CATALOG OF SYSTEMS, PERIPHERALS AND SOFTWARE.** Most major brands. Descriptions complete with options and accessories. Please indicate your specific interest and application. Micro Trend Inc., 2001 Kirby Drive, Suite 900, Houston, TX 77019. (713) 520-0107.

**NEW IBM PC-X1 SALE!** Discount prices hardware and software. Seven printers, monitors, peripherals. Call (213) 824-1213.

**COMPUTERS, PRINTERS, ACCESSORIES!** Epson FX-80 Printer, \$519.00. Gemini 10X Printer, \$295.00. Okidata Printers, etc.—Lowest prices! Free catalog! Team Computers, (203) 777-2284, 109 Church St., Suite #303, New Haven, CT 06510.

### COMPUTER EQUIPMENT/SUPPLIES

**WANT A PLEASANT SURPRISE?** Call or write for quotes: Atari, Commodore, Timex, T.I., Corona (IBM work-alike), Amdek, Analog, Apple & IBM accessories, Hayes, More. GET SURPRISED! HARDWARE SOFTWARE ANYWARE CO., 10 Coles Street, Brooklyn, NY 11231-(212) 596-3392.

**COMPUTER PAPER—SAVE \$\$\$**—Top quality, Low single-carbon prices. Free shipping via UPS. Call A-1, (800) 628-8736 or (213) 804-1270.

**PRINT WHEELS WITH DURARI F GLASS REINFORCED CHARACTERS.** For Diablo, QUME, C, ITOH Printers. Last up to 10X longer than conventional plastic printheads. Business Support Services, 705 Butternut Ave., Troy, MI 48073. (313) 585-4736.

### COMPUTER PUBLICATIONS

**MAKE MONEY NOW** with microcomputer and related products! The best monthly newsletter tells how. Let us help you plan, start, grow! How, Box 218, Washington, IL 61571.

**HOW TO MAKE MONEY WITH YOUR MICROCOMPUTER.** Hard-back, 168 page guide shows how... Money back guaranteed... Send \$14.95 to RH Publications, P.O. Box 105/C, Sullivan, IL 61951. Send \$1.00 for specialized computer book list.

**VALLEY VIDEO & COMPUTER EXCHANGE.** Looking to exchange computer information, buy, sell, or trade software, or video-related items? Your 36 page monthly classified ad will be printed in our new video/computer newsletter for FREE, with no obligation! Send your ad today to: VALLEY VIDEO & COMPUTER EXCHANGE, R.O. Box 3011, Napa, CA 94558.

**SAVE \$5 on Computer books & software!** For FREE DISCOUNT CATALOG write: Downtown Book Dealer, Dept. C, P.O. Box 2490, Brooklyn, NY 11202.

**YOUR OWN Microcomputer based mail order business.** Free info. Bork Research, 23 East Elm St., Quincy MA 02170.

### COMPUTER CLUB

**JOIN THE BIG RED APPLE CLUB**, a national Apple user's group with benefits including monthly newsletter and large library of free software. Annual membership \$12. Sample newsletter \$1. BIG RED APPLE CLUB, 1301 N. 19th, Norfolk, NE 68101 (402) 319-3531.

**JOIN A FAST GROWING COMPUTER CLUB** for TRS-80 owners & users. Monthly Newsletter with FREE Programs and special club prices on computer accessories. Annual Membership \$16. Enclose this Ad with membership fee and receive Free Club Hat. To: American Computer League, P.O. Box 2726, Pomona, CA 91769.

### FOR SALE/BARTER

**CABLE TV SECRETS**, the informative publication the Cable Companies tried to ban. HBO, Movie Channel, Showtime, converters, etc. Send \$8.95 to CABLE FACTS, Box 711CC, Pataskala, OH 43062.

**CABLE T.V. EQUIPMENT**. Channel 36/4 Notch Filter \$20.00. Information \$1.00. Collocoast, P.O. Box 63/6025B, Margate, FL 33063.

### BUSINESS OPPORTUNITIES

**MAIL ORDER OPPORTUNITY!** Start profitable home business without experience or capital. Information tree. MAIL ORDER ASSOCIATES, Dept. 585, Mountville, NJ 07645.

**MULTI-LEVEL** marketing of national brand home computers and software. For information write Computer Logic, P.O. Box 418061, Indianapolis, IN 46241.

*And now it's time for the*

# "YOU KNOW IT'S GOT TO BE TOO GOOD TO BE TRUE" DEPARTMENT

*The following is a reprint of a bogus flyer which Steve Wozniak, co-founder of Apple, passed around at the First West Coast Computer Faire in April of 1977.*  
*How many will you take?*

## from altair™ to zaltair™

Predictable refinement of computer equipment should suggest online reliability. The elite computer hobbyist needs one logical optionless guarantee, yet:

Ed Roberts  
President, MITS, Inc.

Imagine a dream machine. Imagine the computer surprise of the century, here today. Imagine Z80 performance plus. Imagine BAZIC in ROM, the most complete and powerful language ever developed. Imagine raw video, plenty of it. Imagine autoscroll text, a full 16 lines of 64 characters. Imagine eye-dazzling color graphics. Imagine a blitz fast 1200 baud cassette port. Imagine an unparalleled I/O system with full ALTAIR-100 and ZALTAIR-150 bus compatibility. Imagine an exquisitely designed cabinet that will add to the decor of any living room. Imagine the fun you'll have. Imagine Zaltair, available now from MITS, the company where microcomputer technology was born.

## baZIC™

Without software a computer is no more than a racing car without wheels, a turntable without records, or a banjo without strings. BAZIC is the language that puts ZALTAIR's powerful hardware at your fingertips. For example, you can test the entire memory with the MEMTEST statement. Or read the keyboard directly with the KBD function. If you like to keep time the CLK function will really please you. And in case you're in a hurry, you'll be glad to know that BAZIC runs twice as fast as any BASIC around. The best thing of all about BAZIC is the ability to define your own language . . . a feature we call perZonality. And ZALTAIR's BAZIC language comes standard in ROM, to insure "tip-off" security.

## hardware

We really thought this baby out before we built it. Two years of dedicated research and development at the number ONE microcomputer company had to pay off, and it did. A computer engineer's dream, all electronics are on a single pc card. EVEN THE 18-SLOT MOTHERBOARD! And what a motherboard. The ZALTAIR-150 bus is fully ALTAIR-100 compatible with 50 extra connectors. In addition, with ZALTAIR advanced I/O structure called vorZatility, access to peripherals is easier than ever before. And of course, our complete line of ALTAIR peripherals is directly compatible with the ZALTAIR 8800.

## don't miss out

Weighing just 16 pounds, the ZALTAIR 8800 is a portable computer. The highly attractive enclosure was designed by an award winning team, and is fabricated from high-impact, durable ABS Cyclocac® plastic. In the MITS tradition, nothing is compromised. Because of its superior design we were able to price the ZALTAIR 8800 far below the competition for this special introductory offer only. You will not find the ZALTAIR in any store. We want to bring this incredible offer to you directly, and avoid the retail mark-up of a middle man. Already, over 100 ZALTAIR's have been delivered to 75 satisfied customers. Don't miss out, order your ZALTAIR before April 30, 1977, and get immediate delivery.

### Dr. Miles Little Pills

increase the flow of digestive fluids. They are small, easy to swallow and mild but thorough in action.

### Dr. Miles Laxative Tablets

have an effect similar to that Mrs. Place of castor oil on the lower bowel. They taste more like candy than like medicine and children really like them.



## Constipation Poisons The System

Their usefulness, however, is not confined to children as they are equally effective for people of all ages.

If you have to use a Laxative regularly, you will find Dr. Miles Little Pills and Dr. Miles Laxative Tablets, taken on alternate days, very effective.

I use your Little Pills and Laxative Tablets with splendid results.

Mrs.  
Andrew Place  
Huntington, Vt.



25 Cents a Package.

*And now our modern version of the super-bestest, latest and greatest, just plain neat-o-cool personal computer you can throw a dime at!*  
*The Multi-Adjustable Automatic Computer*



*'The news is here and the news is big, the alliance between Microsoft, Intel, Hewlett Packard, AT&T, and McDonalds has hit pay dirt! The MAAC is among us!'*

Incorporating superb design and sophisticated technology, MAAC pushes aside, steps on and kicks the competition. It is every computer you need it to be; thanks to its ground breaking pseudo-adjustoDOS! This DOS is smarter than you are. No need to think to compute now! Why adjustoDOS? Well . . . just wait! The MAAC has broken the ground rules! It has new Multi-CPU Chip Changer with Random Chip Choice Programming. That's right, just pop in up to 6 different CPU chips of your choice, grab your VCR voice remote and you're ready to run anything. Just think of it, you can run all the best - Pentium, PowerPC, MIPS, Intel whatever86s, Motorola 68something and even some of your old favorites like the 6502 and Z80!

## THE BRAINS HAVE IT!

How is this possible you say? That's the interesting part. We were experimenting for months at the Intel labs on a better main processor to direct the MAAC. So far, we could only come up with the 8058678. And as you can guess, Microsoft, HP and AT&T were pretty worthless on the project. Then, when we were just about to throw our fifth prototype in the dumper, someone spilled the Mickey D's special sauce all over the motherboard! To our distaste and surprise, the acidity and grease amplified the throughput ratio by 1000%! Yep, the all-new, delicious Big-Mae58678 controls all of the functions of the multi-multiprocessors and adjustoDOS. This gives you unheard of freedom to better express yourself. For now on, as a proud MAAC owner, you can snub your nose at other computer owners who say they can do this or that - YOU CAN DO IT ALL!! Keep um guessing by choosing your software in stores with your eyes shut! It don't matter what it is, you've got MAAC.

*For more information, simply mail \$100 in care of this publication to:*

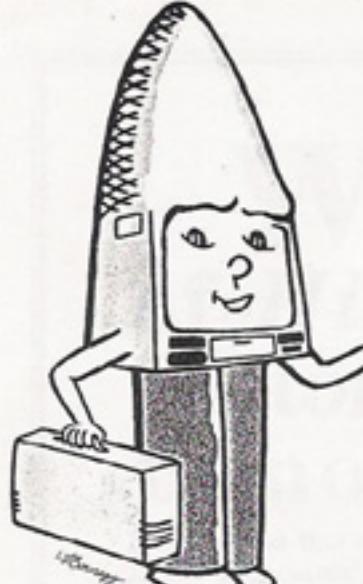
**Gimme a MAAC Info & sit back, relax and wait.**



# ATTENTION HUMANS!

# MAGIC HAS LANDED

*- the computer for the serious of mind.*



Like television and stereo, computers can be used by many different people, in offices and business, in schools and at home...the interest in programs is the difference.

Excessive consumption of mass quantities is EASY with Z80A and 6502 processors and up to FOUR 100KB DISK DRIVES.

Planning and Scheduling • Church and Association Management • Mortgage and Interest Details •

LOVE is a ready-to-use computer system.



Games for Executives • Menu and Recipe Files • Retail and Store Management • Mail List Operations • Activity and Hobby Organizing • Learning FORTRAN • Order and Sales Entry • Christmas Presents List • College



Extensive selection of software abound everywhere at economy levels.

Professional Appointment Book • Income Tax Preparation • Accounts Receivable • Accounts Payable and Aging • School Administration

64K RAM, dual processor system, video, communications and printer interfaces.

Property and Asset Management • Engineering Circuitry • Sports and Activity Statistics • Medical and Legal Accounting • Wordprocessing and Letters • Travel

Thesis and Reports • Data Communications • Business Marketing • File and Retrieval Systems • Dental Office Management • Librarying and Cataloging • Indexing for Small Business • Household Inventory • Investment Analysis and Tracking •

BASIC Programming and Learning • Electronic Spreadsheet • Administrative Reports • Address File, Control and Updating • Dictionary and Spelling • Your Own Private Secretary • Designing Forms • Information for Insurance and Hospitalization

**Magic**  
computer



MAGIC speaks many languages including CBASIC which comes with system, plus a dictionary, a word processor, an electronic spreadsheet and a filing system — FREE.

BASIC Programming and Learning • Electronic Spreadsheet • Administrative Reports • Address File, Control and Updating • Dictionary and Spelling • Your Own Private Secretary • Designing Forms • Information for Insurance and Hospitalization

Historical  
Computer  
Society

"Admirers of the youngest antiques around!"

10928 Ted Williams Place • El Paso, TX 79934